

RESTORATION OF FIR BUTTE: 2016 ANNUAL REPORT



3/31/2017

Report to the Bureau of Land Management Agreement
L14AC00314-0001

Report prepared by Matt Schultz
Institute for Applied Ecology



PREFACE

This report is the result of agreement number L14AC003014-0001 between the Institute for Applied Ecology (IAE) and the Bureau of Land Management. IAE is a non-profit organization whose mission is the conservation of native ecosystems through restoration, research and education. Our aim is to provide a service to public and private agencies and individuals by developing and communicating information on ecosystems, species, and effective management strategies and by conducting research, monitoring, and experiments. IAE offers educational opportunities through 3-4 month internships.



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Cover photograph: AmeriCorps volunteers plant native species in the nectar islands at Fir Butte. November 2016. *Photo by Matt Schultz.*

SUGGESTED CITATION

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TABLE OF CONTENTS

PREFACE	II
ACKNOWLEDGMENTS	III
SUGGESTED CITATION	III
TABLE OF CONTENTS	IV
INTRODUCTION	1
SUMMARY OF ACCOMPLISHMENTS IN 2016	1
2016 ACTIVITIES	2
LOCATION OF NECTAR ISLANDS AND EXPERIMENTAL PLOTS	3
2017 ANTICIPATED ACTIVITIES	6

RESTORATION OF FIR BUTTE: 2016 ANNUAL REPORT

REPORT TO THE BUREAU OF LAND MANAGEMENT

INTRODUCTION

Fir Butte is a site owned and managed by the Bureau of Land Management (BLM) and located in Lane County, Oregon, in the West Eugene Wetlands. The primary emphasis of the work of the Institute for Applied Ecology at Fir Butte is to manage and enhance the prairie habitat. The upland prairie at Fir Butte includes populations of several rare species, most notably Kincaid's lupine (*Lupinus oregonus*) and Fender's blue butterfly (*Icaricia icarioides fenderi*). Management actions at the site are consistent with those necessary to support populations of these rare species.

SUMMARY OF ACCOMPLISHMENTS IN 2016

In 2016, the Institute for Applied Ecology participated in a variety of activities to support restoration and conservation efforts at Fir Butte (Table 1).

Activities included weed control, native species enhancement, support for a prescribed burn, and support for an on-going experiment evaluating the non-target impacts of herbicide use on prairies supporting Fender's blue butterfly.

- String-trimmers were used to mow tall oatgrass (*Arrhenatherum elatius*) across the site and hand weeding was done to target removal of species of management concern.
- Four additional nectar islands (8 m x 10 m) were planted with plugs, bulbs, and bare-root stems and seeded with native species. Bare root, plugs, and bulbs were purchased from Heritage Seedlings, including dwarf checkermallow (*Sidalcea malviflora* spp. *virgata*), Roemer's fescue (*Festuca roemeri*), Pacific woodrush (*Luzula comosa*), narrowleaf onion (*Allium amplexans*), and barestem desert parsley (*Lomatium nudicaule*) (Table 2). Native seed was provided from the City of Eugene's native plant nursery (Tables 3).
- Fire breaks were mowed around eight research plots and woody vegetation was removed to facilitate a prescribed burn in fall 2016.
- A Fusilade (fluazifop) herbicide treatment was applied to four research plots using an ATV-mounted boom sprayer on March 31st.

An Inter-Agency team consisting of personnel from the BLM, Army Corps of Engineers, and US Forest Service conducted a prescribed burn covering 4 acres on September 16th. Native forbs

and grasses were seeded on the burned unit on October 19th and research plots were seeded on October 11th.

2016 ACTIVITIES

Table 1: On-the-ground restoration activities completed at Fir Butte in 2016.

Date	Action	Who	Description
3/31/2016	Herbicide application	IAE	Applied Fusilade herbicide to four experimental plots to test non-target impact of using Fusilade to manage prairie harboring Fender's blue butterfly
4/19-4/20	Hand weeding	IAE, Looking Glass crew	Hand-weeded meadow knapweed (<i>Centaurea pratensis</i>), Purpleanther field pepperweed (<i>Lepidium heterophyllum</i>), bull thistle (<i>Cirsium vulgare</i>), tansy ragwort (<i>Senecio jacobea</i>) in northern portion of site; removed hairy cat's ear (<i>Hypochaeris</i> spp.), sheep sorrel (<i>Rumex acetosella</i>), and bentgrasses (<i>agrostis</i> spp.) from nectar islands
5/6	Survey for Fender's blue butterfly	IAE and BLM	Distance sampling for Fender's blue butterfly
5/27, 6/2	Hand mow tall oatgrass	IAE	Hand mowed tall oatgrass at 6" throughout site (Figure 2). Where growing concurrently with Kincaid's lupine, mowed above top of raceme. Did not mow Cheryl Schultz's research plots in the SW corner.
7/26	Hand weeding	BLM and Looking Glass crew	Hand weeded and bagged meadow knapweed, mainly in the NW corner
8/17	Hand weeding	IAE and BLM	Removed Himalayan blackberry (<i>Rubus armeniacus</i>) from edges of nectar islands, weeded nectar islands
8/22	Burn break prep	IAE and BLM	Mowed edges of Schultz research plots to prepare for prescribed burn.
8/22	Shadecloth	IAE and BLM	Replaced shadecloth on nectar island 2c.
9/2	Fire break prep	IAE	Removed tree on the edge of fire break on Schultz research plot.
9/16	Prescribed burn	Inter-Agency burn crew	Burned 4 acres in SE corner; burned 8 research plots in SW corner.
10/19	Seeding	BLM	Seeded burn unit with native mix (Table 4)
11/8	Planting	IAE, BLM, Looking Glass, AmeriCorps, volunteer	Planted bulbs and bareroot lomatium in plots 1c, 2c, 4c & 5c (Figure 1)
11/21	Planting	IAE, BLM, Looking Glass, AmeriCorps, volunteer	Planted plugs and bulbs in plots 4c, 1c, 2c, and 5c, (Figure 1)
11/29	Seeding	IAE	Overseeded plots 1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 4a, 4b, 4c, 5a,5b, 5c (Table 3)

LOCATION OF NECTAR ISLANDS AND EXPERIMENTAL PLOTS



Fir Butte, Shadecloth and Solarization Plots

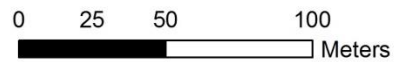


Figure 1: Location of nectar islands and test plots at Fir Butte.



Figure 2. IAE Restoration Technician Anna Ramthun carefully mowing tall oatgrass adjacent to Kincaid's lupine. Photo by Matt Schultz

Table 2: Summary of fall 2016 native species plantings by plot at Fir Butte.

Species planted		Form	Plot 1c	Plot 2c	Plot 4c	Plot 5c
Scientific name	Common name		Numbers of plants			
<i>Sidalcea malviflora</i> <i>spp. virgata</i>	dwarf checkermallow	Medium plugs	400	400	400	400
<i>Allium amplexans</i>	narrowleaf onion	Bulbs	375	375	375	375
<i>Festuca roemerii</i>	Roemer's fescue	Medium plugs	100	100	100	100
<i>Luzula comosa</i>	Pacific woodrush	Medium plugs	200	200	200	200
<i>Lomatium nudicaule</i>	barestem desert parsley	Bareroot stems	800	800	500	500
Total number of plants			1875	1875	1575	1575

Table 3: Seed mix broadcast over plots 1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 4a, 4b, 4c, 5a, 5b, and 5c in fall 2016 at Fir Butte.

Scientific name	Common name	Total seed (PLS in lbs)
<i>Achillea millefolium</i>	yarrow	0.20
<i>Camassia leichtlinii</i>	large camas	1.59
<i>Clarkia purpurea</i>	farewell to spring	0.06
<i>Epilobium densiflorum</i>	denseflower willowherb	0.09
<i>Eriophyllum lanatum</i>	Oregon sunshine	0.17
<i>Festuca roemerii</i>	Roemer's fescue	0.84
<i>Linanthus bicolor</i>	true babystars	0.02
<i>Lomatium nudicaule</i>	barestem desert parsley	0.19
<i>Microseris laciniata</i>	cutleaf silverpuffs	0.17
<i>Nemophila menziesii</i> var. <i>atomaria</i>	baby blue eyes	0.05
<i>Plectritis congesta</i>	shortspur seablush	0.21
<i>Potentilla gracilis</i>	slender cinquefoil	0.07
<i>Prunella vulgaris</i> var. <i>lanceolata</i>	lance selfheal	0.31
<i>Sidalcea malviflora</i> spp. <i>virgata</i>	dwarf checkermallow	0.83
<i>Wyethia angustifolia</i>	California compassplant	0.48
Total seed (lbs)		5.28
Total area seeded (acres)		0.28 acres

Table 4. Seed mix broadcast after prescribed burn at Fir Butte in 2016.

Scientific name	Common name	Total seed (PLS in lbs)
<i>Achillea millefolium</i>	yarrow	0.53
<i>Allium amplexans</i>	narrowleaf onion	0.26
<i>Camassia leichtlinii</i>	large camas	3.53
<i>Clarkia purpurea</i>	farewell-to-Spring	0.53
<i>Eriophyllum lanatum</i>	Oregon sunshine	1.47
<i>Lomatium nudicaule</i>	barestem desert parsley	26.46
<i>Microseris laciniata</i>	cutleaf silverpuffs	7.06
<i>Plectritis congesta</i>	shortspur seablush	3.53
<i>Potentilla gracilis</i>	slender cinquefoil	1.06
<i>Prunella vulgaris var. lanceolata</i>	lance selfheal	0.71
<i>Ranunculus occidentalis</i>	western buttercup	2.12
<i>Sidalcea malviflora spp. virgata</i>	dwarf checkermallow	12.05
Total seed (lbs)		59.28
Total area seeded (acres)		4 acres

2017 ANTICIPATED ACTIVITIES

In 2017, IAE will continue several of the 2016 activities, including hand weeding, mowing of tall oatgrass, and the initial stages of small-scale restoration of portions of the meadow. IAE expects to continue fluazifop applications on the research plots managed by Dr. Cheryl Schultz. Upon approval from the BLM, IAE will begin targeted herbicide treatments of glyphosate on tall oatgrass and bracken fern across the site, triclopyr on patches of Himalayan blackberry, clopyralid on patches of meadow knapweed (*Centaurea pratensis*), and glyphosate on invasive grasses in the nectar islands. IAE will continue to collaborate with the BLM to support the process leading up to herbicide implementation.